

Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted in amended claims is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) optionally in double brackets [[]]. In brief, applicant has canceled pending claims 1-19 and 53, and added new claims 54-75 to more particularly point out and distinctly claim aspects of their invention.

1-53. (Canceled)

54. (New) A method of separating a target material from a liquid mixture, comprising:

selecting colloidal magnetizable particles having a binding affinity for the target material, wherein the magnetizable particles are prepared by

forming and at least substantially purifying aggregates of two or more crystallites of a magnetizable metal oxide,

coating the formed and at least substantially purified aggregates with a polysaccharide material, and

treating the polysaccharide material so that it has a binding affinity for the target material;

combining the magnetizable particles with the liquid mixture containing the target material for a sufficient time for the target material to bind to the magnetizable particles;

applying a magnetic field to the combination of the magnetizable particles and the liquid mixture; and

separating the magnetizable particles, including the target material bound thereto, from the liquid mixture, using the magnetic field.

55. (New) The method of claim 54, wherein the target material is an inorganic material, an organic compound, or a biological material.

56. (New) The method of claim 54, wherein the crystallites have a particle size of about 3 nm to about 25 nm.

57. (New) The method of claim 54, wherein the magnetizable particles have a particle size of about 50 nm to about 500 nm.

58. (New) The method of claim 57, wherein the magnetizable particles have a particle size of about 70 nm to about 450 nm.

59. (New) The method of claim 54, wherein the magnetizable metal oxide is a magnetizable iron oxide.

60. (New) The method of claim 54, wherein the step of forming aggregates of crystallites includes a step of aging the crystallites to increase the size of the aggregates, prior to the step of purifying.

61. (New) The method of claim 54, wherein the step of forming aggregates of crystallites includes a step of treating precipitated magnetite with an acid, with a solution of a ferric salt, or with a base to form a colloidal suspension.

62. (New) The method of claim 54, wherein the step of forming aggregates of crystallites includes a step of treating precipitated magnetite with a reactant selected

from the group consisting of nitric acid, perchloric acid, a solution of ferric nitrate, and tetramethylammonium hydroxide.

63. (New) The method of claim 54, wherein the step of coating the aggregates includes a step of bonding the polysaccharide material directly to the aggregate of crystallites of the magnetizable metal oxide.

64. (New) The method of claim 54, wherein the step of coating the aggregates includes steps of bonding an organosilane directly to the aggregate of the crystallites, and bonding the polysaccharide material to the organosilane.

65. (New) The method of claim 64, wherein the step of bonding a polysaccharide material to the organosilane includes a step of attaching the polysaccharide material to a pendant functional group on the organosilane.

66. (New) The method of claim 54, wherein the step of combining the magnetizable particles with the liquid mixture includes a step of dispersing the particles in the mixture.

67. (New) The method of claim 54, further comprising:
dissociating the magnetizable particles and the target material, after the step of separating, so that they no longer are bound to one another; and
removing the magnetizable particles using a magnetic field to provide a substantially pure preparation of the target material.

68. (New) The method of claim 54, the polysaccharide material having at least one pendant functional group, wherein the step of treating the polysaccharide material includes a step of attaching a coupling group having an affinity for the target material to the polysaccharide material via the functional group.

69. (New) The method of claim 68, wherein the pendant functional group of the polysaccharide is a carboxyl group, a carbonate, an amino group or derivatized amino group, an aldehyde group, a sulfhydryl group, or a displaceable group.

70. (New) The method of claim 68, wherein the pendant functional group of the polysaccharide is a carboxyl group attached to the polysaccharide through a linker having at least one heteroatom for every three carbon atoms in the linker.

71. (New) The method of claim 70, wherein the heteroatom of the linker is oxygen.

72. (New) The method of claim 70, wherein the linker is derived from ethylene glycol, an oligoethylene glycol, or a polyethylene glycol.

73. (New) The method of claim 70, further comprising introducing the pendant functional group of the polysaccharide by reaction with chloroethoxyethoxyacetic acid and base.

74. (New) The method of claim 68, wherein the polysaccharide is dextran.

75. (New) The method of claim 68, wherein the coupling group is selected from the group comprising antibody, nucleic acid, enzyme, ligand, epitope, binding protein, and chelate.